Notes - Factoring Trinomials with $a \neq 1$

$$ax^2 + bx + c$$

1. Find the 2 numbers whose product is $a \cdot c$ and whose sum is b (*$a \cdot c$ | $+b$)
2. Use those 2 numbers from step 1 to split apart the bx
3. Factor by grouping

Ex: Factor $2x^2 + 17x + 21$

$ax^2 + bx + c$

Need *ac: 2(21) = 42	+b: 17
1, 42	43x
6, 7	13x
2, 21	23x
3, 14	17 ✓

$2x^2 + 3x + 14x + 21$

$2 \cdot x \cdot x$ | $3 \cdot x$ | $2 \cdot 7 \cdot x$ | $3 \cdot 7$

$x(2x + 3) + 7(2x + 3)$

$$\boxed{(x+7)(2x+3)}$$

Ex 2: Factor $3x^2 + 1x - 2$

Need 3(-2) = -6	+1
-1, 6	5x
-3, 2	-1
-2, 3	1 ✓

$3x^2 + 3x - 2x - 2$

$3x \cdot x$ | $3 \cdot x$

$3x(x+1) - 2(x+1)$

$$\boxed{(3x-2)(x+1)}$$